U.S. Department
of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Preventing Injuries Caused by Turbulence

Date: 11/19/07 **AC No:** 120-88A
Initiated by: AFS-200 **Change:** 1

1. PURPOSE. This advisory circular (AC) has been revised to remove information about Turbulence Auto-PIREP System (TAPS) and the Troposheric Aircraft Meteorological Data Reporting (TAMDAR) weather reporting system due to product unavailability.

2. PRINCIPAL CHANGES. This change removes information from paragraphs 17, 18, and 19 and updates all references in the document.

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James J. Ballough
Director, Flight Standards Service

14. THREE FUNDAMENTALS OF EFFECTIVE PRACTICES AGAINST TURBULENCE.

a. Turbulence Avoidance as Corporate Culture. The first and most fundamental step in developing effective practices is for an air carrier to adopt a corporate culture of avoidance of turbulence as the first line of defense. Implementing a turbulence avoidance culture can include SOPs for dispatch and flight operations providing for rerouting around forecast and observed turbulence, and for observing standard clearances between thunderstorms and aircraft.

b. Rerouting. In the past the practice of rerouting has been met with limited air carrier acceptance, primarily because of the inaccuracy of first generation turbulence forecast products, the subjectivity inherent in Pilot Weather Reports (PIREP) (if available), and the operational costs of rerouting. However, recent advances in automation, atmospheric modeling, and data display have improved forecast accuracy, data delivery, and PIREP subjectivity, improving the odds that a well-chosen rerouting would in fact avoid turbulence.

c. Standard Clearances Between Thunderstorms and Aircraft. See Appendix 2.

15. OTHER EFFECTIVE PRACTICES THAT CAN BE USED BY MANAGERS, TRAINERS, METEOROLOGISTS, AND AIRCRAFT DISPATCHERS. Effective practices can include:

a. Use all applicable weather data and products including alphanumeric weather information such as Aviation Routine Weather Reports (METARS), area forecasts and terminal area forecasts (TAF), wind and temperature forecasts, NWS in-flight advisories such as Significant Meteorological Advisories (SIGMETS), Convective SIGMETS and Airman's Meteorological Information (AIRMETS), upper air charts, graphical radar summaries or composites, and satellite imagery.

b. Use sophisticated product generation to merge diverse sources into graphical product to track turbulence.

c. Compile turbulence information, including PIREPs, making relevant information easily usable to dispatchers, flightcrews, and air traffic controllers (ATC).

16. NEW SYSTEMS OF TURBULENCE REPORTING AND FORECASTING. Since 1997, major advances in data processing and delivery have allowed graphical depictions of weather to be delivered in near real-time, even to the flight decks of suitably equipped aircraft. Advanced reporting, forecasting, and delivery of graphics have been promoted by government/industry partnerships and by the leadership of various organizations.

17. ADDITIONAL STEPS TO TAKE TO AVOID TURBULENCE AND THEREBY PREVENT CABIN INJURIES. Continued improvement in turbulence-related weather products requires better handling of real-time information on the state of the atmosphere at any given time. The most promising way to capture and convey this information is through a comprehensive program of reports from aircraft in flight. That program would be founded on automated turbulence reporting supplemented by human reports PIREPs. This system would generate real-time, automatic reports of hazardous turbulence events, and displays the

information for improved operations around turbulence. The report will quantify the severity of the loads experienced in the aircraft's cabin in accordance with the standard levels of light, moderate, severe, and extreme as described in the FAA's Aeronautical Information Manual (AIM). These downlinked reports would be displayed on dispatchers' flight-following display network, and could be scaled and used to predict and inform other aircraft of potential turbulence encounter severity. Reports only would be generated whenever significant turbulence events are encountered.

(1) Air carriers could improve the coverage and objectivity of atmospheric turbulence reports by installing automated aircraft turbulence downlink systems on all ACARS-equipped aircraft.

(2) Air carriers should encourage additional reporting of PIREPs by flightcrews through air carrier PIREPs awareness campaigns and by training flightcrews to follow established PIREPs procedures.

(3) Air carriers could establish communications links and encourage flightcrews to deliver air carrier PIREPs to the NWS and to the FAA.

18. EFFICIENT DELIVERY OF CURRENT INFORMATION. In conjunction with improved turbulence reporting, air carriers may join other industry groups and government organizations to develop faster processing and delivery of current turbulence information, e.g., develop a plan to integrate required improvements in conjunction with normal upgrade/replacement cycles for turbulence detection systems, and/or a cost-effective mix of Internet, Intranet, and other evolving communications systems.

19. ACTIONS TO TAKE TO SUPPORT EMERGING TECHNOLOGIES. Air carriers support development and implementation of emerging technologies when they work with organizations, and equipment manufacturers to develop industry standards for emerging turbulence technologies and weather formats for flight deck display systems.

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